

COMPLETE LIST OF CURRENTLY AMENDED & PREVIOUSLY PRESENTED CLAIMS

1. (Currently Amended) A computer-implemented method for constructing and tangibly expressing a conic peak-point curve comprising:
- (i) selecting a start point, a_0 on a computer image display of an implementing computer with a computer input device of the implementing computer;
 - (ii) selecting an end point, a_1 on the computer image display system with the computer input device;
 - (iii) selecting a start tangent direction, e_0 on the computer image display system with the computer input device;
 - (iv) selecting an end tangent direction, e_1 on the computer image display system with the computer input device, whereupon the computer image display system, responsive to the implementing computer, displays a centerline bisecting a chord between the start and end points a_0, a_1 , extending through an intersection point r of rays extending in the start and end tangent directions e_0, e_1 respectively from the start and end points a_0, a_1 ;
 - (v) selecting ~~[a distance of]~~ a peak point, p , on the centerline ~~[from the chord between the start and end points, a_0, a_1 , on the computer image display system with the computer input device]~~ where the peak point is a point on the curve that is farthest away from the chord between the start and end points a_0, a_1 , ~~[lying on a centerline segment connecting the center of the chord with a intersection point r of rays extending in the start and end tangent directions e_0, e_1 respectively from the start and end points a_0, a_1]~~ whereupon the implementing computer, using any suitable mathematical formulac, constructs a conic peak-point curve passing through the start point a_0 , the peak point p , and the end point a_1 , with the start tangent direction e_0 and the end tangent direction e_1 ; and
 - (vi) expressing tangibly the conic peak-point curve using any image display system controlled by the implementing computer.

2.(Previously Presented) A computer-implemented method for constructing and tangibly expressing a conic point-point curve comprising:

(i) selecting a start point, a_0 on a computer image display system of an implementing computer with a computer input device of the implementing computer;

5 (ii) selecting a start tangent direction, c_0 on the computer image display system with the computer input device;

(iii) selecting a peak point, p , whereupon the computer image display system, responsive to the implementing computer, displays a guide area for locating possible end points loci defined by two rays intersecting at a point s that lies on one of two rays that extends from the start point a_0 in the direction of the peak point p at twice (2X) the distance of the peak point p from the start point a_0 , the remaining ray extending from s in a direction opposite to the start tangent direction c_0 ;

10 (iv) selecting with the computer input device any point in the guide area displayed on the computer image display system as an end point a_1 for a conic point-point curve, whereupon the implementing computer, using any suitable mathematical formulae constructs a conic point-point curve passing through the start point, a_0 , peak point, p , and the end point a_1 with the start tangent direction c_0 , where an end tangent direction c_1 is derived from a point of intersection of rays extending in the start and end tangent directions c_0, c_1 , which coincides with the intersection of a ray extending in the start tangent direction, c_0 and a centerline extending through the center of a chord between the start and end points a_0, a_1 , and through the peak point, p ; and

15 (v) expressing tangibly the constructed conic point-point curve using any image display system controlled by the implementing computer.

3. (Previously Presented) A computer-implemented method for constructing and tangibly expressing a conic point-tangent curve comprising

(i) selecting a start point, a_0 on a computer image display system of an implementing computer with a computer input device of the implementing computer;

(ii) selecting a start tangent direction, c_0 on the computer image display system with the computer input device;

(iii) selecting an end point, a_1 on the computer image display system with the computer input device;

(iv) selecting an end tangent direction, e_1 on the computer image display system with the computer input device;

(v) selecting a weight, w for the curve with a computer input device of the implementing computer, whereupon the implementing computer, using any suitable mathematical formulae, constructs a conic point-tangent curve passing through the start point, a_0 , and the end point a_1 with the start tangent direction c_0 and the end tangent direction c_1 , where a peak point p is calculated by the weight, w , which is a parameter defining a proportion between a distance, D_q of the peak point p from a center point, q of a chord between the start and end points a_0, a_1 and a distance, D_r of the peak point p from an intersection point, r of rays extending in the start and end tangent directions e_0, e_1 respectively from the start and end point a_0, a_1 ; and

(vi) expressing tangibly the constructed conic point-tangent curve using any image display system controlled by the implementing computer.

4. (Previously Presented) The method of claim 3 wherein the selected weight w is calculated from a fixed arbitrarily defined positive number v , multiplied by $\cos(\alpha/2)$, where α is an angle between the start and end tangent directions e_0, e_1 extending from a common point, and the constructed curve converges to limit as α approaches 180° .

5 5. (Previously Presented) A computer-implemented method for constructing and tangibly expressing a conic point curve comprising:

- (i) selecting a start point, a_0 on a computer image display system of an implementing computer with a computer input device of the implementing computer;
- (ii) selecting a start tangent direction, e_0 on the computer image display system with the computer
10 input device;
- (iii) selecting an end point, a_1 on the computer image display system with the computer input device;
- (iv) selecting a weight, w , with a computer input device of the implementing computer, whereupon the implementing computer, using any suitable mathematical formulae, constructs
15 a conic point curve passing through the start point a_0 and the end point a_1 with the start tangent direction e_0 , where an end tangent direction e_1 is set by pre-defined parameters selected with a computer input device, where a peak point p is calculated by the weight w , which is a parameter defining a proportion between a distance D_q of the peak point p from a center point q of a chord between the start and end points a_0, a_1 , and a distance D_r of the peak
20 point p from an intersection point r of rays extending in the start and end tangent directions e_0, e_1 respectively from the start and end point a_0, a_1 ; and
- (v) expressing tangibly the constructed conic point curve using any image display system controlled by the implementing computer.

6. (Previously Presented) The method of claim 5 wherein the selected weight w is calculated from a fixed arbitrarily defined positive number v , multiplied by $\cos(\alpha/2)$, where α is an angle between the start and end tangent directions e_0 , e_1 extending from a common point, and the constructed curve converges to limit as α approaches 180° .

5 7. (Previously Presented) A computer-implemented method for constructing and tangibly expressing a conic curvature curve comprising

(i) selecting a start point, a_0 on a computer image display system of an implementing computer with a computer input device of the implementing computer;

10 (ii) selecting a start tangent direction, e_0 on the computer image display system with the computer input device, whereupon the implementing computer displays a guideline perpendicular to the start tangent direction, e_0 on the computer image display system for a center m_0 of a start curvature circle, r_0 ;

(iii) selecting a center m_0 of the start curvature circle, r_0 on the displayed guideline; and

15 (iv) selecting an end point a_1 on the computer image display system with the computer input device; and

(v) selecting an end tangent direction, e_1 on the computer image display system with the computer input device, whereupon the implementing computer, using any suitable mathematical formulae, constructs a conic curvature curve through the start point a_0 and the end point a_1 , with the start tangent direction e_0 and the end tangent direction e_1 , with the center m_0 of the start curvature circle r_0 , and a center m_1 for an end curvature circle r_1 is calculated; and

20 (vi) expressing tangibly the constructed conic curvature curve using any image display system controlled by the implementing computer.

8. (Previously Presented) A computer-implemented method for constructing and tangibly expressing a class of point curvature curves including cubic Bezier curves and conics comprising:

- (i) selecting a start point, a_0 on a computer image display system of an implementing computer with a computer input device of the implementing computer;
- (ii) selecting a start tangent direction, e_0 on the computer image display system with the computer input device, whereupon the implementing computer displays a guideline perpendicular to the start tangent direction, e_0 for a center m_0 of a start curvature circle r_0 on the computer image display system;
- (iii) selecting a center m_0 of a start curvature circle r_0 on the displayed guideline on the computer image display system with the computer input device;; and
- (iv) selecting an end point a_1 on the computer image display system with the computer input device, whereupon the implementing computer, using any suitable mathematical formulae, constructs a point curvature curve passing through the start point a_0 and the end point a_1 , with the start tangent direction e_0 and the center m_0 of the start curvature circle r_0 , where an end tangent direction e_1 is set by pre-defined parameters selected with a computer input device; and
- (v) expressing tangibly the constructed point curvature curve using any image display system controlled by the implementing computer.

9. (Previously Presented) The method of claim 8 wherein the constructed curve is a conic and a center m_1 of an end curvature circle r_1 is thereby automatically determined.

10. (Previously Presented) The method of claim 8 wherein the constructed curve is a cubic Bezier curve, and a center m_1 of the end curvature circle r_1 is set by a defined parameter selected using a computer input device.

11. (Previously Presented) A computer-implemented method for constructing and tangibly expressing a Bezier point-tangent curve comprising:

- (i) selecting a start point, a_0 on a computer image display system of an implementing computer with a computer input device of the implementing computer;
- 5 (ii) selecting a start tangent direction, e_0 on the computer image display system with the computer input device;
- (iii) selecting an end point, a_1 on the computer image display system with the computer input device;
- 10 (iv) selecting an end tangent direction, e_1 on the computer image display system with the computer input device;
- (v) selecting a weight, w with an input device of the implementing computer, whereupon the implementing computer, using any suitable mathematical formulae, constructs a Bezier point-tangent curve passing through the start point, a_0 , and the end point a_1 with the start tangent direction e_0 and the end tangent direction e_1 , having a peak point p calculated to lie on a
15 centerline segment connecting a center point q of the chord between the start and end points a_0, a_1 with an intersection point, r of rays extending in the start and end tangent directions e_0, e_1 from the start and end point a_0, a_1 respectively, the weight, w specifying a proportion between a distance, D_q of a peak point p from the center point q of a chord and a distance, D_r of the peak point p from the intersection point, r of the start and end tangents;
- 20 (vi) expressing tangibly the constructed Bezier point-tangent curve using any image display system controlled by the implementing computer.

12. (Previously Presented) The method of claim 11 wherein the selected weight w is calculated from a fixed arbitrarily defined positive number v , multiplied by $\cos(\alpha/2)$, where α is an angle between the

start and end tangent directions c_0 , c_1 extending from a common point, and the constructed curve converges to limit as α approaches 180° .

13. (Previously Presented) A computer-implemented method for constructing and tangibly expressing a Bezier point curve comprising:

- (i) selecting a start point, a_0 on a computer image display system of an implementing computer with a computer input device of the implementing computer;
- (ii) selecting a start tangent direction, e_0 on the computer image display system with the computer input device;
- (iii) selecting an end point, a_1 on the computer image display system with the computer input device;
- (iv) selecting a fixed weight, w , with an input device of the implementing computer, whereupon the implementing computer, using any suitable mathematical formulae, constructs a Bezier point curve passing through the start point a_0 with the start tangent direction c_0 , and the end point a_1 , where an end tangent direction e_1 is set by pre-defined parameters selected with an input device of the implementing computer, having a peak point p calculated to lie on a centerline segment connecting a center point q of the chord between the start and end points a_0 , a_1 with an intersection point, r of rays extending in the start and end tangent directions c_0 , e_1 from the start and end point a_0 , a_1 respectively, the weight, w specifying a proportion between a distance, D_q of a peak point p from the center point q of a chord and a distance, D_r of the peak point p from the intersection point, r of the start and end tangents; and
- (v) expressing tangibly the constructed Bezier point curve using any image display system controlled by the implementing computer.

14. (Previously Presented) The method of claim 13 wherein the selected weight w is calculated from a fixed arbitrarily defined positive number v , multiplied by $\cos(\alpha/2)$, where α is an angle between the start and end tangent directions e_0 , e_1 extending from a common point, and the constructed curve converges to limit as α approaches 180° .

5 15. (Previously Presented) A computer-implemented method for constructing and tangibly expressing a simple point-point curve comprising:

- 10 (i) selecting a start point, a_0 , on a computer image display system of an implementing computer with a computer input device of the implementing computer;
- (ii) selecting a peak point, p , on a computer image display system of an implementing computer with a computer input device, where the peak point is a point on the curve that is farthest away from the chord between the start and end points a_0 , a_1 ;
- (iii) selecting an end point a_1 on a computer image display system of an implementing computer with a computer input device;
- 15 (iv) selecting a weight w for the curve with a computer input device of the implementing computer, whereupon the implementing computer, using any suitable mathematical formulae, constructs a simple point-point curve passing through the start point, a_0 , the peak point, p , and the end point a_1 , where, using the weight w , a point r is derived on a centerline extending from a center point, q , of a chord between the start and end points, a_0 , a_1 , and through the peak point, p , establishing an intersection of rays extending through the start and end points, a_0 , a_1 ,
- 20 setting start tangent and an end tangent directions, e_0 , e_1 ; and
- (iv) expressing tangibly the constructed point-point curve using any image display system controlled by the implementing computer.